IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

A.L.M. HOLDING CO., ERGON ASPHALT & EMULSIONS, INC., and MEADWESTVACO CORP., Plaintiffs, v. AKZO NOBEL SURFACE CHEMISTRY LLC, Defendant.	Civil Action No.1:13-cv-1069-GMS **JURY TRIAL DEMANDED**

A.L.M. HOLDING CO., ERGON ASPHALT & EMULSIONS, INC., and MEADWESTVACO CORP., Plaintiffs, v. ARR-MAZ CUSTOM CHEMICALS, INC., Defendant.	Civil Action No. 1:13-cv-1070-GMS **JURY TRIAL DEMANDED**

SECOND AMENDED JOINT CLAIM CONSTRUCTION CHART

Plaintiffs A.L.M. Holding Co., Ergon Asphalt & Emulsions, Inc., and MeadWestvaco Corp. (collectively "Plaintiffs") and defendants Akzo Nobel Surface Chemistry LLC and Arr-Maz Custom Chemicals, Inc. (collectively "Defendants") hereby submit this Second Amended Joint Claim Construction Chart regarding disputed claim terms in U.S. Patent Nos. 7,815,725 ("the '725 patent") and 7,981,466 ("the '466 patent").

Second Amended Joint Claim Construction Chart

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
"functionally dry" '725 Patent Claims: 1, 25 '466 Patent Claims: 12b, 17a	Each of the terms "functionally dry" or "essentially water-free" means or is intended to refer to an asphalt binder composition that contains less water or moisture than is routinely used in conventional or known (i.e., foamed or emulsified) warm mixes. Intrinsic Evidence: • '725 patent, 1:15-24, 28-52; 2:19-66; 3:1-4, 12-38.	These terms are indefinite under § 112, but for purposes of claim construction: An asphalt binder composition that contains less water or moisture than is routinely used in conventional or known warm mixes. '466 patent claim 12: A warm-mix paving composition that contains less water or moisture than is routinely used in conventional or known warm mixes. Intrinsic Evidence from U.S. 7,815,725 Specification: • The term "functionally dry" as used herein in connection with compositions, aggregates or mixtures is used to describe reduced water content compositions, aggregates or mixtures, particularly those in the "warm mix" regime, as further described herein. Col. 1, ll. 34-38. • Another meaning for the term "functionally dry" as used herein is "essentially water-free" as described in the detailed description. Col. 1, ll. 50-52. • As used in the present application, each of the terms "functionally dry" or "essentially water- free" means or is intended to refer to an asphalt binder composition that contains less water or moisture than is routinely used in conventional or known warm mixes. This term does not mean and is not intended to refer to a warm mix composition that is completely free of water, moisture or added water. Col. 2, ll. 43-49.

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
		• Even though the asphalt binder compositions may have the water or moisture content adjusted or altered, these compositions are considered to be functionally dry because the overall water content is lower or substantially lower than other known or conventional warm mix asphalt binder compositions and mixtures. Col. 3, ll. 14-20. • Adjustments or alterations of the water or moisture concentrations that take into account different asphalt grades are also considered to be functionally dry (or essentially water-free) asphalt binder compositions. When variations in the water contents of different aggregates and different asphalt grades are accounted for, the asphalt/aggregate mixes of mixtures of the present invention will typically have a water content in a range of less than about 5 wt %. In many instances the water content is less than about 1 wt %. Col. 3, ll. 22-3.
"essentially water-free" '725 Patent Claims: 1, 25 '466 Patent Claims: 12b, 17a	Same as "functionally dry" above. Intrinsic Evidence: • '725 patent, 1:15-24, 28-52; 2:19-66; 3:1-4, 12-38.	These terms are indefinite under § 112, but for purposes of claim construction: An asphalt binder composition that contains less water or moisture than is routinely used in conventional or known warm mixes. '466 patent claim 12: A warm-mix paving composition that contains less water or moisture than is routinely used in conventional or known warm mixes Intrinsic Evidence: • Same as "functionally dry" above.

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
"non-foamed" '725 Patent Claims: 1, 25 '466 Patent Claims: 12b, 17a	"not produced using a foaming process" Intrinsic Evidence: • '725 patent, 1:15-21; 2:19-22, 27-42; 9:2-4, 34-38, 42-53. • WO2007/032915 at 3. • '725 pros. history, 3/2/10 Amendment at 7, 9 (citing Reinke US 2007/006676). • '725 pros. history, 2/16/10 Reinke Decl. at 1-2 (citing Reinke US 2007/006676). • '725 pros. history, 2/5/10 Engber Decl. at 1 (citing Reinke US 2007/006676). • '725 pros. history, 2/15/10 Baumgardner Decl. at 1 (citing Reinke US 2007/006676). • '725 pros. history, 8/11/10 Notice of Allowability at 2-3. • '725 reexam 90/011,731 pros. history, 3/4/13NIRC at 5. • '466 pros. history, 11/30/10 Office Action at 4, 7-8 (citing Reinke US 2007/006676). • '466 pros. history, 4/28/11 Office Action at 7, 8 (citing Reinke US 2007/006676). • '466 pros. history, 11/30/19 Notice of Allowability at 2 (citing Reinke US 2007/006676 and Larsen US 2002/0170464)	Asphalt binder that does not contain foam ('725 patent, claim 1; '466 patent, claim 1) Warm-mix paving composition that does not contain foam ('466 patent, claim 12) Intrinsic Evidence from U.S. 7,815,725 Specification: • The only component of the foaming, lubricating solution remaining with the asphalt is an effective concentration of surfactant providing the lubricating effect. This observation indicates that the incorporation of water in conjunction with foam for the production of warm mix is not an essential component in all instances, although the water may be used in a system for delivery of the lubricating additive into the asphalt binder or cement. The present invention thus relies, in part, in determining that the lubricating properties of additives added to an asphalt binder or cement are an important component of the present warm mix asphalt mixtures and that it is not necessary or essential to use foamed asphalt binders or emulsified asphalt binders that are used in conventional warm mix asphalt binder compositions, mixtures and paving processes. Col. 2, ll. 30-42. *See* WO 2007/032915 incorporated by reference that uses a "foaming lubricating aqueous solution".
"binder-coated"	Plain and ordinary meaning, but if the Court requires a further construction:	Aggregate 100% coated with binder

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
'725 Patent Claims: 1, 25 '466 Patent Claims: 1a, 12b, 13, 14, 17a	"having binder on all or substantially all surfaces" Intrinsic Evidence: • '725 patent, 2:61-66; 3:1-4, 39-47; 4:62-67; 10, 20-22; 5:53; 11:8-12; 11:35-36, 65-66; 13:23- 28, 43-45.	Intrinsic Evidence from U.S. 7,815,725 Specification: • A 100% coating was achieved of the aggregate at this temperature. Col. 9, ll 3-4. • However, when the mix discharge temperature was stabilized at 225° F to 235° F the coating of the aggregate was at 100%. Col. 10, ll 20-22. • The coating was 100% and comparable to the hot mix version that was compacted previously. Col. 11, ll 65-66.
"coated with binder and lubricating additive" '725 Patent Claims: 1, 25 '466 Patent Claims: N/A	Plain and ordinary meaning, but if the Court requires a further construction: "having binder containing lubricating additive on all or substantially all surfaces" Intrinsic Evidence: • '725 patent, 2:61-66; 3:1-4, 39-47; 4:62-67; 10, 20-22; 5:53; 11:8-12; 11:35-36, 65-66; 13:23-28, 43-45.	Aggregate 100% coated with binder and lubricating additive Intrinsic Evidence: • Same as "binder-coated" above.
"to coat" '725 Patent Claims: N/A '466 Patent Claims: 1a, 12b, 17a, 20c	Plain and ordinary meaning, but if the Court requires a further construction: "to apply binder on all or substantially all surfaces" Intrinsic Evidence: • '725 patent, 2:61-66; 3:1-4, 39-47; 4:62-67; 10, 20-22; 5:53; 11:8-12; 11:35-36, 65-66; 13:23- 28, 43-45.	To apply binder to 100% of the surfaces Intrinsic Evidence: • Same as "binder-coated" above.
"coated" '725 Patent Claims: 1, 25 '466 Patent Claims: 1a, 12b, 13, 14, 17a	Plain and ordinary meaning, but if the Court requires a further construction: "having binder on all or substantially all surfaces" Intrinsic Evidence: • '725 patent, 2:61-66; 3:1-4, 39-47; 4:62-67; 10, 20-22; 5:53; 11:8-12; 11:35-36, 65-66; 13:23-28, 43-45.	100% coated with binder Intrinsic Evidence: • Same as "binder-coated" above.

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
"coating" '725 Patent Claims: N/A '466 Patent Claims: 18	Plain and ordinary meaning, but if the Court requires a further construction: "applying binder on all or substantially all surfaces" Intrinsic Evidence: • '725 patent, 2:61-66; 3:1-4, 39-47; 4:62-67; 10, 20-22; 5:53; 11:8-12; 11:35-36, 65-66; 13:23-28, 43-45.	Applying binder on 100% of the surfaces Intrinsic Evidence: • Same as "binder-coated" above.
"warm mix temperature" '725 Patent Claims: 1, 2, 13, 14, 20, 21, 22, 23, 26, 37, 38, 44, 45, 46, 47 '466 Patent Claims: 1a, 12b, 13, 14, 17a, 20a	"a temperature at least 30° F lower than used in conventional hot-mix asphalt" Intrinsic Evidence: • '725 patent, 2:19-23; 7:16-20; 8:26-36; 10:1-5, 17-24, 35-39; 11:4-16, 26-29; 12:45-58, Table 2, Examples 1-11. • WO2007/032915 at 3. • '725 pros. history, 5/13/09 Amendment and Response at 10. • '725 pros. history, 6/19/09 RCE at 3. • '725 pros. history, 9/13/10 Communication at 1. • '725 reexam 90/011,731 pros. history, 10/11/11 Patent Owner's Statement at 3-4. • '725 reexam 90/011,731 pros. history, 12/29/11 Written Statement at 3-6. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 8-9. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 10-11, 12.	This term is indefinite under § 112, but for purpose of claim construction: <u>"warm mix temperature" with respect to production temperature means:</u> A temperature at least 30°F lower than the temperature needed to produce a comparison paving composition without the lubricating additive <u>"warm mix temperature" with respect to paving temperature means:</u> A temperature at least 30°F lower than the temperature needed for proper paving of a comparison paving composition without the lubricating additive
"warm mix paving composition" '725 Patent Claims: N/A '466 Patent Claims: 12b, 13, 14, 17a, 17b, 17c, 17d, 19	"an asphalt paving composition produced at a temperature that is at least 30° F lower than used in conventional hot-mix asphalt" Intrinsic Evidence: • '725 patent, 2:19-23; 7:16-20; 8:26-36; 10:1-5, 17-24, 35-39; 11:4-16, 26-29; 12:45-58, Table 2, Examples 1-11. • WO2007/032915 at 3. • '725 pros. history, 5/13/09 Amendment and Response at 10. • '725 pros. history, 6/19/09 RCE at 3. • '725 pros. history, 9/13/10 Communication at 1. • '725 reexam 90/011,731 pros. history,	This term is indefinite under § 112 because of included indefinite term, but for purpose of claim construction: A composition of asphalt binder, lubricating additive and aggregate produced at a temperature at least 30°F lower than the temperature needed to produce a comparison composition without the lubricating additive

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
	10/11/11 Patent Owner's Statement at 3-4. • '725 reexam 90/011,731 pros. history, 12/29/11 Written Statement at 3-6. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 8-9. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 10-11, 12.	
"warm mix asphalt paving composition" '725 Patent Claims: 1-14, 16-38, 40-52 '466 Patent Claims: N/A	"an asphalt paving composition produced at a temperature that is at least 30° F lower than used in conventional hot-mix asphalt" Intrinsic Evidence: • '725 patent, 2:19-23; 7:16-20; 8:26-36; 10:1-5, 17-24, 35-39; 11:4-16, 26-29; 12:45-58, Table 2, Examples 1-11. • WO2007/032915 at 3. • '725 pros. history, 5/13/09 Amendment and Response at 10. • '725 pros. history, 6/19/09 RCE at 3. • '725 pros. history, 9/13/10 Communication at 1. • '725 reexam 90/011,731 pros. history, 10/11/11 Patent Owner's Statement at 3-4. • '725 reexam 90/011,731 pros. history, 12/29/11 Written Statement at 3-6. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 8-9. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 10-11, 12.	This term is indefinite under § 112 because of included indefinite term, but for purpose of claim construction: A composition of asphalt binder, lubricating additive and aggregate produced at a temperature at least 30°F lower than the temperature needed to produce a comparison composition without the lubricating additive
"warm mix asphalt binder composition" '725 Patent Claims: 15-18, 39-42 '466 Patent Claims: N/A	This contains a typographical error. This phrase should be corrected to read, "warm mix asphalt paving composition" as defined above. Intrinsic Evidence: • '725 patent, 2:19-23; 7:16-20; 8:26-36; 10:1-5, 17-24, 35-39; 11:4-16, 26-29; 12:45-58, Table 2, Examples 1-11. • WO2007/032915 at 3. • '725 pros. history, 5/13/09 Amendment and Response at 10. • '725 pros. history, 6/19/09 RCE at 3. • '725 pros. history, 9/13/10 Communication at 1. • '725 reexam 90/011,731 pros. history, 10/11/11 Patent Owner's Statement at 3-4.	This term is indefinite under § 112 because of included indefinite term, but for purpose of claim construction: A composition of asphalt binder, lubricating additive and aggregate produced at a temperature at least 30°F lower than the temperature needed to produce a comparison composition without the lubricating additive

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
	• '725 reexam 90/011,731 pros. history, 12/29/11 Written Statement at 3-6. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 8-9. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 10-11, 12.	
"warm mix temperature range" '725 Patent Claims: N/A '466 Patent Claims: 20a	"a temperature range of at least 30° F lower than used in conventional hot-mix asphalt binder" Intrinsic Evidence: • '725 patent, 2:19-23; 7:16-20; 8:26-36; 10:1-5, 17-24, 35-39; 11:4-16, 26-29; 12:45-58, Table 2, Examples 1-11. • WO2007/032915 at 3. • '725 pros. history, 5/13/09 Amendment and Response at 10. • '725 pros. history, 6/19/09 RCE at 3. • '725 pros. history, 9/13/10 Communication at 1. • '725 reexam 90/011,731 pros. history, 10/11/11 Patent Owner's Statement at 3-4. • '725 reexam 90/011,731 pros. history, 12/29/11 Written Statement at 3-6. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 8-9. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 10-11, 12.	This term is indefinite under § 112 but for purpose of claim construction: Within a range of temperatures at least 30°F lower than the temperature needed for a comparison paving composition without the lubricating additive
"warm mix paving temperature" '725 Patent Claims: N/A '466 Patent Claims: 20e	"a paving temperature at least 30° F lower than the paving temperature in conventional hot-mix asphalt" Intrinsic Evidence: • '725 patent, 2:19-23; 7:16-20; 8:26-36; 10:1-5, 17-24, 35-39; 11:4-16, 26-29; 12:45-58, Table 2, Examples 1-11. • WO2007/032915 at 3. • '725 pros. history, 5/13/09 Amendment and Response at 10. • '725 pros. history, 6/19/09 RCE at 3. • '725 pros. history, 9/13/10 Communication at 1. • '725 reexam 90/011,731 pros. history, 10/11/11 Patent Owner's Statement at 3-4. • '725 reexam 90/011,731 pros. history,	This term is indefinite under § 112, but for purpose of claim construction: A temperature at least 30°F lower than the temperature needed for proper paving of a comparison paving composition without the lubricating additive

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
	12/29/11 Written Statement at 3-6. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 8-9. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 10-11, 12.	
"warm mix lubricated asphalt binder composition" '725 Patent Claims: N/A '466 Patent Claims: 20a, 20b	"a combination of asphalt binder and lubricating substance used to create asphalt paving composition at a warm mix temperature range" Intrinsic Evidence: • '725 patent, 2:19-23; 7:16-20; 8:26-36; 10:1-5, 17-24, 35-39; 11:4-16, 26-29; 12:45-58, Table 2, Examples 1-11. • WO2007/032915 at 3. • '725 pros. history, 5/13/09 Amendment and Response at 10. • '725 pros. history, 6/19/09 RCE at 3. • '725 pros. history, 9/13/10 Communication at 1. • '725 reexam 90/011,731 pros. history, 10/11/11 Patent Owner's Statement at 3-4. • '725 reexam 90/011,731 pros. history, 12/29/11 Written Statement at 3-6. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 8-9. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 10-11, 12.	This term is indefinite under § 112 because of included indefinite term, but for purpose of claim construction: A composition of asphalt binder and lubricating substance for mixing with aggregate to form a paving material at least 30°F lower than the temperature needed to produce a comparison composition without the lubricating additive
"warm mix paving material" '725 Patent Claims: N/A '466 Patent Claims: 20c, 20d, 20e, 21, 22	"a paving material created by mixing aggregate with warm mix lubricated asphalt binder composition" Intrinsic Evidence: • '725 patent, 2:19-23; 7:16-20; 8:26-36; 10:1-5, 17-24, 35-39; 11:4-16, 26-29; 12:45-58, Table 2, Examples 1-11. • WO2007/032915 at 3. • '725 pros. history, 5/13/09 Amendment and Response at 10. • '725 pros. history, 6/19/09 RCE at 3. • '725 pros. history, 9/13/10 Communication at 1. • '725 reexam 90/011,731 pros. history, 10/11/11 Patent Owner's Statement at 3-4. • '725 reexam 90/011,731 pros. history,	This term is indefinite under § 112 because of included indefinite term, but for purpose of claim construction: Aggregate coated with a warm mix lubricated asphalt binder composition

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
	12/29/11 Written Statement at 3-6. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 8-9. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 10-11, 12.	
"is produced at and is at" '725 Patent Claims: 1, 25 '466 Patent Claims: N/A	Plain and ordinary meaning, but if the Court requires a further construction: "is produced at and, at some point after production, is at" Intrinsic Evidence: • '725 patent, 9:53-59, 10:1-3, 17-21, 11:35-41, 12:45-54; Examples 1-11. • '725 reexam 90/011,731 pros. history, 1/4/12 Interview Summary at 2. • '725 reexam 90/011,731 pros. history, 1/2/13 Supp. Amendment at 10-11.	This term is indefinite under § 112, but for purposes of claim construction, defendants propose the following: Is produced at and after production is at
"a comparison temperature needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive" '725 Patent Claims: 1, 13, 14, 25, 37, 38 '466 Patent Claims: N/A	"the minimum temperature needed to produce a comparable paving composition without the lubricating additive" Intrinsic Evidence: • '725 patent, 3:39-46; 7:42-45; 8:54-58; FIG. 1; FIG. 2; FIG. 4 • '725 pros. history, 11/20/08 Amendment and Response at 6. • '725 pros. history, 5/13/09 Amendment and Response at 7. • '466 pros. history, 11/30/10 Office Action at 10.	These terms are indefinite under § 112, but for purpose of claim construction: The minimum temperature needed to produce a paving composition containing binder-coated aggregate without the lubricating additive Intrinsic Evidence from U.S. 7,815,725 Specification: • This application discloses that surfactants in both aqueous or non-aqueous form and waxes are two general classes of lubricating additives that may, when incorporated into an asphalt binder or cement at levels as low as 0.1 wt %, provide sufficient lubrication of the asphalt cement so that aggregate may be adequately coated at temperatures 30-50° F lower, even more than 50° F. lower, or as much as 100° F lower than the temperatures normally needed to produce a bituminous mixture without an

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
		added lubricating additive or agent. The lubricating additive then enables compaction of these mixtures at 30-50° F lower, even more than 50° F lower, or as much as 100° F lower than the temperatures normally needed for compaction of similar bituminous mixtures. Col. 3, ll 39-51. • This application also discloses that different concentrations of phosphoric acid, are another class of additives that can, when incorporated into an asphalt cement at levels as low as about 0.2-1.0 wt %, provide sufficient lubrication of the asphalt cement so that aggregate may be adequately coated at temperatures 30-50° F, or greater difference, below the temperatures normally needed to produce a bituminous mixture without the phosphoric acid additives. Col. 4, ll 62-5:2. • For common binders used in the practice of the present invention, the visco-lubricity characteristics of the binder and lubricating agent composition affect the temperature needed to provide thorough coating of the aggregate and application and compaction of the asphalt and aggregate mixture according to the present invention. Col. 13, ll 23-28.
"a comparison paving temperature needed for proper paving of the comparison paving composition"	"the minimum temperature needed to properly pave a comparable paving composition produced without the lubricating additive" Intrinsic Evidence: • '725 patent, 3:39-46; 7:42-45; 8:54-58; FIG. 1; FIG. 2; FIG. 4	This term is indefinite under § 112, but for purpose of claim construction: The minimum temperature needed to properly pave a paving composition containing binder-coated aggregate without the lubricating additive

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
'725 Patent Claims: 2, 26 '466 Patent Claims: N/A	• '725 pros. history, 11/20/08 Amendment and Response at 6. • '725 pros. history, 5/13/09 Amendment and Response at 7. • '466 pros. history, 11/30/10 Office Action at 10.	Intrinsic Evidence: • See "a comparison temperature needed to produce a comparison paving composition containing binder- coated aggregate without the lubricating additive" above.
"a comparison production temperature needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive" '725 Patent Claims: N/A '466 Patent Claims: 1a, 12b, 13, 14, 17a	"the minimum temperature needed to produce a comparable paving composition without the lubricating additive" Intrinsic Evidence: • '725 patent, 3:39-46; 7:42-45; 8:54-58; FIG. 1; FIG. 2; FIG. 4 • '725 pros. history, 11/20/08 Amendment and Response at 6. • '725 pros. history, 5/13/09 Amendment and Response at 7. • '466 pros. history, 11/30/10 Office Action at 10.	Same as "a comparison temperature needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive" above. Intrinsic Evidence: • See "a comparison temperature needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive" above.
"lubricating" '725 Patent Claims: 1, 6, 9, 10, 11, 12, 19, 24, 25, 30, 33, 34, 43, 48, 49, 50, 51, 52 '466 Patent Claims: 1a, 4, 5, 10, 11, 12a, 12b, 13, 14, 17a, 20, 24, 25, 26	Plain and ordinary meaning, but if the Court requires a further construction: "allowing easier motion between two or more objects" Intrinsic Evidence: • '725 patent, 2:28-42; 3:39-51; 4:17-41, 42-49, 62-67; 5:12-6:6; 6:25-32; 7: 53-54; 8:29-30; Examples 1-11. • '725 pros. history, 11/20/08 Amendment and Response at 7. • '725 pros. history, 6/19/09 RCE at 2. • '725 reexam 90/011,731 pros. history, 10/11/11 Patent Owner's Statement at 312. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 13. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 11.	Defendant Akzo Nobel: No construction necessary. Defendant Arr-Maz: Providing a reduction in the normal force of an asphalt binder with an additive as compared to the normal force of the asphalt binder without the additive at high rotational velocities Intrinsic Evidence from U.S. 7,815,725 Specification: • FIG. 1 is a graph plotting measured viscosity and normal force properties with respect to velocity as a measure of lubricity of an asphalt cement and an asphalt cement modified with a lubricating surfactant. • FIG. 2 is a graph plotting measured viscosity and normal force properties with respect to

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
		velocity as a measure of lubricity of an asphalt cement and two asphalt cements modified with a lubricating wax. • FIG. 3 is a graph plotting the measured viscosities and normal forces with respect to velocity as a measure of lubricity of an asphalt cement at three different temperatures. • FIG. 4 is a graph plotting the measured viscosities and normal force properties with respect to velocity as a measure of lubricity of an asphalt cement, a related polymer-acid modified asphalt cement further modified with polyphosphoric acid, a polymer-acid modified asphalt cement further modified with a liquid antistripping additive and a polymer-acid modified asphalt cement further modified with a lubricating surfactant. Col. 1, ll 64 to Col. 2., ll 15; see also Figures 1-4. • While not intending to be bound by theory, the present invention is based, in part, on the observations that the lubricating agents and additives disclosed in this application provide a warm mix having desired visco-lubricity characteristics or properties. As used in this application the term "visco-lubricity" means a characteristic of a material that it exhibits under high rotational velocity as the gap thickness of the material being tested approaches zero. As the gap thickness is reduced and as rotational velocity is increased, the material's viscosity

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
		begins to decrease by the normal force between the plates begins to increase. A material that has good visco- lubricity characteristics will exhibit less normal force increase than one that has poor visco-lubricity. Col. 5, ll 12-24. • An example illustrating the meaning of the term "visco-lubricity" is the observed reduced requirements for the mixing and compaction temperatures of polymer modified asphalt binders compared to conventional asphalt binders. Col. 5, ll 27-31. <u>Laboratory Testing of Lubricity</u> • Since there are no readily available rheological tests identified for determining the lubricity of asphalt cement, the following test provides comparative testing of asphalt cement at different temperatures and with different additives to determine lubricity. This test is described as follows: 1. An AR2000 dynamic shear rheometer using a heated air test chamber was utilized. 2. A shallow cylindrical cup measuring approximately 35 mm in diameter with [sic] and approximately 5 mm in height was used to contain the liquid being tested. This cup was secured to the bottom pedestal of the text fixture in the rheometer. 3. A small quantity of the asphalt cement or asphalt cement plus lubricating additive was added to the bottom of the cup. A 25

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
		mm diameter flat plate was used as an upper test fixture in the rheometer. This upper test fixture is a typical test fixture used in plate-plate rheological testing with this instrument. 4. The plate attached to the upper text figure is brought into contact with the specimen in the cup and the gap is reduced until a membrane of material to be tested is either 100 or 50 μm thick. 5. The test we used is a steady shear test with increasing velocity. The specimen is maintained at a constant temperature while the upper plate rotates in one direction with a programmed increase in angular velocity. As the rotational speed increases the drag between the upper plate and the bottom of the cup increases. In addition normal force increases attempting to force the plates apart. The more lubricating character an additive has the lower the normal force buildup. • In reference to Figures, the upper sets of plotted data are for viscosity, while the lower sets of plotted data are for normal force. Col. 6, ll 46 to Col. 7, ll 12. • See also Examples 1-4. In particular: • Then the blends with the additives exhibit lower normal forces and in several instances the normal force values peak

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
		and then diminish. The data in this plot supports the assertion that (1) the addition of wax additives such as Sasobit™ wax do not appreciably diminish the viscosity in the low to medium velocity ranges of the asphalt cement at warm mix compaction temperatures (regardless of the dosage level) and (2) the addition of the wax additive does provide evidence of lubricating the blend compared to the control, neat PG 58-28. Col. 7, ll 46-54. • FIG. 2 illustrates the normal force comparison of neat PG 58-28 (open circles), 1.5 wt% Sasobit™ wax (open squares), 1% montan wax (solid squares) and 0.5% wt % Sasobit™ wax (solid circles). The normal force for the neat PG 58-28 increases to approximately 8 Newtons at 100 radians/second. The normal force for the 1.5 wt% Sasobit™ wax increases to approximately 5.5 Newtons before decreasing. Both the 1 wt % montan was and 0.5 wt % Sasobit™ wax only reach a normal force maximum of about 3 Newtons. Col. 7, ll 61 to Col. 8, ll 3. • Example 4 illustrates the impact of polyphosphoric acid (PPA) plus other additives on the reduction of normal force buildup in the asphalt binder. A polymer modified PG 58-34 which also contains PPA as a reactant was tested induplicate (open and solid circles). Additionally 0.5 wt % INNOVLT W phosphate ester antistripping material was added to the PG 58-34 and tested in another sample 0.3

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
		wt % E-6 ethoxylated tallow diamine was added to the PG 58-34. All of these samples were compared to a standard PG 58-28. All tests were conducted at 90 °C with a 50 μm test gap. The data plotted in FIG. 4 indicate that even though the viscosity of the 58-34 and its blends (upper curves on the plot) are greater than the viscosity of the PG 58-28, the normal force values are uniformly lower at 10 radians/second and higher. The INNOVALT W added to the PG 58-34 showed the greatest reduction in normal force build-up, but the PG 58-34 with just the acid additive also showed surprising reduction in normal force relative to a neat, unmodified binder. In summary, PPA at typical usage levels (0.2 to 1 wt%) can serve as a lubricating additive in the production of warm mix asphalt binder compositions. Col. 8, ll 41-61. • See also claims 11, 12, 35 and 36 of the '725 patent. • U.S. Provisional Application Ser. No. 60/976,141 and U.S. Provisional Application Ser. No. 60/970,809. 3:59-61. • Non-surfactant additives based on wax chemistry have been incorporated into an asphalt binder or cement to produce warm mix based on the concept that these wax additives reduce the viscosity of the wax asphalt blend to an extent sufficient to enable production and lay down of the asphalt/ aggregate mixture at reduced temperatures. Col. 4, ll

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
		16-22 • This application discloses that surfactants in both aqueous or non-aqueous form and waxes are two general classes of lubricating additives that may, when incorporated into an asphalt binder or cement at levels as low as 0.1 wt %, provide sufficient lubrication of the asphalt cement so that aggregate may be adequately coated at temperatures 30-50° F lower, even more than 50° F lower, or as much as 100° F lower than the temperatures normally needed to produce a bituminous mixture without an added lubricating additive or agent. The lubricating additive then enables compaction of these mixtures at 30-50° F lower, even more than 50° F lower, or as much as 100° F lower than the temperatures normally needed for compaction of similar bituminous mixtures. Col. 3, ll 39-51.
"lubricated" '725 Patent Claims: N/A '466 Patent Claims: 20a, 20b, 20c	Plain and ordinary meaning, but if the Court requires a further construction: "having been mixed with a lubricating additive" Intrinsic Evidence: • '725 patent, 2:28-42; 3:39-51; 4:17-41, 42-49, 62-67; 5:12-6:6; 6:25-32; 7: 53-54; 8:29-30; Examples 1-11. • '725 pros. history, 11/20/08 Amendment and Response at 7. • '725 pros. history, 6/19/09 RCE at 2. • '725 reexam 90/011,731 pros. history, 10/11/11Patent Owner's Statement at 312. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 13. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 11.	Defendant Akzo Nobel: No construction necessary. Defendant Arr-Maz: A reduction in the normal force of an asphalt binder with an additive as compared to the normal force of the asphalt binder without the additive at high rotational velocities Intrinsic Evidence: • See "lubricating" above.

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
"lubricating additive" '725 Patent Claims: 1, 6, 9, 10, 11, 12, 19, 24, 25, 30, 33, 34, 43, 48, 49, 50, 51 '466 Patent Claims: 1a, 5, 10, 11, 12a, 12b, 13, 14, 17a, 24, 25, 26	Plain and ordinary meaning, but if the Court requires a further construction: "an additive that allows easier motion between two or more objects" Intrinsic Evidence: • '725 patent, 2:28-42; 3:39-51; 4:17-41, 42-49, 62-67; 5:12-6:6; 6:25-32; 7: 53-54; 8:29-30; Examples 1-11. • '725 pros. history, 11/20/08 Amendment and Response at 7. • '725 pros. history, 6/19/09 RCE at 2. • '725 reexam 90/011,731 pros. history, 10/11/11 Patent Owner's Statement at 312. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 13. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 11.	Defendant Akzo Nobel: No construction necessary. Defendant Arr-Maz: An additive, that, when added to an asphalt binder, provides a reduction in the normal force of the binder as compared to the normal force of the asphalt binder without the additive at high rotational velocities Intrinsic Evidence: • See "lubricating" above.
"lubricating substance" '725 Patent Claims: N/A '466 Patent Claims: 20a	Plain and ordinary meaning, but if the Court requires a further construction: "a substance that allows easier motion between two or more objects" Intrinsic Evidence: • '725 patent, 2:28-42; 3:39-51; 4:17-41, 42-49, 62-67; 5:12-6:6; 6:25-32; 7: 53-54; 8:29-30, Examples 1-11. • '725 pros. history, 11/20/08 Amendment and Response at 7. • '725 pros. history, 6/19/09 RCE at 2. • '725 reexam 90/011,731 pros. history, 10/11/11 Patent Owner's Statement at 312. • '725 reexam 90/011,731 pros. history, 1/23/12 Response at 13. • '725 reexam 90/011,731 pros. history, 9/28/12 Response at 11.	Defendant Akzo Nobel: No construction necessary. Defendant Arr-Maz: A substance that, when added to an asphalt binder, provides a reduction in the normal force of the binder as compared to the normal force of the asphalt binder without the additive at high rotational velocities Intrinsic Evidence: • See "lubricating" above.
"lubricating substance consisting of an antistripping agent" '725 Patent Claims: N/A	Plain and ordinary meaning, but if the Court requires a further construction: "a lubricating substance (defined above) that is an antistripping agent"	Defendant Akzo Nobel: No construction necessary. Defendant Arr-Maz: An anti-stripping agent that, when added to an asphalt binder, provides a reduction in the normal force of the binder as compared to the normal force

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
'466 Patent Claims: 20a		of the asphalt binder without the additive at high rotational velocities Intrinsic Evidence: • See "lubricating" above. • *See also* When an antistrip functions as desired there is little or no visual de bonding of binder from the aggregate, but it must be considered that reduction in wet strength of the antistrip treated mixes is beginning at the reduced value indicated by the dry strength of the antistrip treated mixes due to the lubricating effect of the antistrip. Col. 6, ll. 26-32.
"viscosity modifier" '725 Patent Claims: N/A '466 Patent Claims: 1a, 12a, 17a, 24, 25, 26	"a substance that stabilizes viscosity as temperature changes" Intrinsic Evidence: • '725 patent, 4:42-61.	§ 112 indefinite.
"dispersant viscosity modifier" '725 Patent Claims: N/A '466 Patent Claims: 1a, 12a, 17a, 24, 25, 26	"a substance that stabilizes viscosity as temperature changes and disperses debris within a liquid" Intrinsic Evidence: • '725 patent, 4:42-61.	§ 112 indefinite.
"asphalt binder" '725 Patent Claims: 1, 5, 11, 12, 25, 29, 35,36 '466 Patent Claims: 17a, 20a	Plain and ordinary meaning.	Plain and ordinary meaning.
"suitable aggregate"	"aggregate suitable for use in the warm mix	§ 112 indefinite.

Disputed Claim Term	Plaintiffs' Proposed Construction and Intrinsic Evidence	Defendants' Proposed Construction and Intrinsic Evidence
'725 Patent Claims: N/A '466 Patent Claims: 20b	paving composition" Intrinsic Evidence: • '725 patent, 13:39-48.	

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